PETROGRAPHY.

Experimental Petrography. — With the increasing number of experiments being made in the attempt to discover the laws governing the formation of crystalline rocks from their magmas some important truths should soon be disclosed. The latest contribution to the subject has recently been made by Bauer,[1] who worked along conventional lines. He fused powdered rocks, mixtures of powdered minerals, and mixtures of chemical compounds, with and without the addition of "mineralizers," held them at temperatures of 1000°–1400° for ten or more hours, and then allowed them to cool. Unfortunately he was unable to prolong the cooling stage to any great extent, and consequently the products obtained were largely glassy.

The wolframates, boric acid, and borax served well as "crystallizers." Under the influence of the first, quartz was produced, and with the aid of the other two, hornblende. The addition of the chlorides and fluorides to the mixture appeared to serve simply to lower the fusing point.

The quartz was obtained as irregular grains in a mass composed of a groundmass of glass, enclosing small laths of feldspar and larger crystals of orthoclase, albite, olivine, and nepheline. This was produced by fusing a mixture of orthoclase, albite, mica, hornblende, sodium chloride, potassium tungstate, boric acid, and sodium phosphate. The quartz is thought to have originated in the breaking up of the mica.

The hornblende was obtained in three experiments. The most interesting consisted in the fusion of a mixture of powdered phonolite and nepheline-basalt, neither of which contained any trace of the mineral. The hornblende was a bright-green variety. In one of the other two experiments powdered diorite was fused with boric acid, sodium phosphate, and calcium fluoride at a temperature of 1000°. The resulting hornblende was brown, while that in the original diorite was green.

The third experiment yielded also brown hornblende. In this powdered hornblende was fused with sodium and calcium fluorides and magnesium chloride.

Another interesting result reached was the discovery that the same mixture under different conditions of temperature and rates of cooling may yield entirely different products. For instance, the powder

[1] Bauer, K. *Neues Jahrb. f. Min.*, etc., Bd. xii, p. 535.

of a nepheline-basalt gave in one case a nepheline-basalt and in two other cases limburgites.

In order that the best results may be reached the author declares that specially prepared apparatus is necessary, but with a proper equipment he believes that much might be learned concerning the method of origin of the different types of igneous rocks by simple fusion experiments.

Notes. — The dikes cutting the mica-gneisses in the vicinity of Johns Bay, Maine, are similar in all essential respects to those near Portland in the same state. Miss Bascom[1] reports that two are olivine diabases, and a third is nonolivinitic.

Gratacap issues a plea[2] for a more interesting display of rocks in museums than that one usually sees. He also suggests along what lines such a display might be constructed to be at the same time of interest and of value.

Judd[3] describes under the name of rockallite the peculiar rock of Rockall Island in the Atlantic, 240 miles west of Ireland. The rock consists of ægirite, quartz, and albite in the proportions 39 : 38 : 23. The albite is sometimes porphyritic. An analysis gives :

SiO_2	Al_2O_3	Fe_2O_3	MnO	NiO	MgO	CaO	K_2O	P_2O_5	Total
73.60	4.70	13.10	93	.06	.11	.37	6.96	=	99.83

The structure is granitic. Its systematic place is in the granite group, although its feldspar is solely albite.

The rocks gathered by the International Boundary Commission along the newly surveyed boundary line between the United States and Mexico are granites, gabbro-diorites, diabases, diorite, porphyries, rhyolites, andesites, and basalts.[4] One of the rhyolites is spherulitic.

The collection of rocks made by Alexander Agassiz in the Fiji Islands contains specimens of granite, andesites, and basalts. Eakle[5] describes augite-andesite as the predominant rock of the islands. It varies from a very feldspathic type to a very basic type that appears to grade into basalt. In addition to this andesite there are also present hypersthenic and hornblendic varieties.

[1] *Amer. Geol.* (1899), vol. xxiii, p. 275.
[2] *Ibid.*, p. 281.
[3] *Trans. Roy. Irish Acad.*, vol. xxxi, Pt. iii, p. 39.
[4] Lord, E. C. E. *Proc. U. S. Nat. Mus.*, vol. xxi, 1899, p. 773.
[5] *Proc. Amer. Acad. Arts and Sci.*, vol. xxxiv (1899), p. 581.